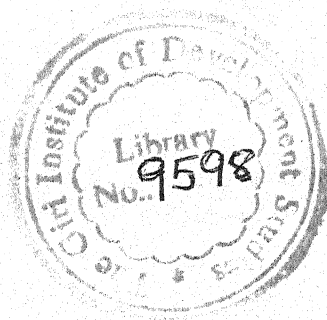


**ECONOMIC INFRASTRUCTURE AND
REGIONAL DEVELOPMENT
IN
INDIA**

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Concept and Importance

To comprehend the actual meaning of the term 'economic infrastructure', it is deemed desirable to acquaint, first of all, with the concept of infrastructure itself. Broadly speaking, infrastructure may be defined in four ways. First, it is conceived as comprising those basic services and public utilities which are essential for various kinds of economic activities concerning primary, secondary and tertiary sectors.¹ Hence, it includes all public services from law and order through education and public health to transportation, communication, power and water supply, as well as such agricultural overhead capital as irrigation and drainage systems.²

Second, the two basic channels of investment as identified in the sphere of development planning are social overhead capital (SOC) and directly productive activities (DPA). Of these, the former is, sometimes, called infrastructure which is, in other words, defined as capital goods used directly or indirectly in the production of goods and services.³ Third, it is also conceived as diversified investment in the general growth of economy like rail-road system and electric power rather

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than the investment in the growth of one specific activity.⁴ Finally, it is said that at least three basic conditions must be fulfilled by an activity for its inclusion in the category of infrastructure : (i) the services provided by the activity facilitate, or are in some sense basic to, the carrying on of a great variety of economic activities; (ii) the services are provided by the public agencies free of charge or at rates regulated by public agencies; and (iii) the services cannot be imported.⁵ However, all the four ways of defining infrastructure emphasise its role as catalytic agent in carrying out a great variety of economic activities.

The major components of this infrastructure are economic as well as social. The economic components comprise road, transport, communication, supply of power and water, and banking, whereas the social components include education, medical services, financial institutions, etc. All these components of infrastructure are deemed to be both cause to and effect of development. Hence, social services particularly education and health are, no doubt, an equally vital bases for development. However, the economic infrastructure considered here assumes much greater importance primarily because of the two major considerations. First, the components of economic infrastructure absorb relatively a larger proportion of Government expenditure and second their planning and development have given rise to many economic issues in developing countries particularly India where Government is committed to achieve the objective of economic growth with social justice.

The importance of economic infrastructure was well recognised even during the nineteenth and early twentieth century when the large share of foreign investment in India was diverted towards building of economic infrastructure particularly railroads.⁶ Obviously, this was justifiable because a certain minimum prior build up of economic infrastructure is always needed for emergence of the necessary spreading effects from the leading sector/space. The scale of this prior minimum build up would, however, vary from economy to economy, depending on their previous history, geography, resources, etc.⁷ Moreover, it is often argued that enhanced availabilities of economic infrastructure like electric power and transportation facilities are essential preconditions for economic development. Although in some cases it does not have a direct bearing on final product, it permits and, in fact, invites direct productive activities to come in. The net work of economic infrastructure is basic to every type of production whether agriculture, manufacturing or service industries, whether production for the home, or the export market.⁸ It stimulates economic growth by making product and factor markets function more efficiently. Some of the economic infrastructure like electricity can have even greater impact on development because they facilitate not only agricultural, industrial and other economic activities but also provide important direct consumption benefits.⁹

In sum, the economic infrastructure plays an activating role in the process of both economic and social development.¹⁰ It occupies a significant place in regional development particularly-

in reconstruction and promotion of depressed or backward regions. It promotes economic efficiency of the region/area by bringing about an enhancement in accessibility to productive resources and physical mobility of the raw materials, finished products and factors of production. It increases the scale of production and helps in establishing the strong economic linkages. Finally, it enhances adoption and coverage of modern technology, growth and diversification of demand for finished products.¹¹

II. Need, Objective and Issues

The public sector programmes in India are primarily concerned with the allocation of public funds preferably among those activities, which are considered to be the sole responsibility of the Government. Hence, the development of economic infrastructure whether transportation and communication facilities, production and distribution of electric power or the construction of irrigation and drainage systems has been considered to be the appropriate field of public investment during the period of previous plans. In its support, we observe that as much as 53 per cent of the total financial outlays in India during the period of planned development was diverted towards development of the core of economic infrastructure, as would be evident from the following table :

Table 1
Plan-wise Financial Allocations for Infrastructural Development in India

(Rs. crore)								
Infrastructure	I Plan 51-56	II Plan 56-61	III Plan 61-66	Annual Plans 66-69	IV Plan 69-74	V Plan 74-79	VI Plan 80-85	Total
A. Economic								
1. Irrigation & Flood Control	434 (22.14)	430 (9.20)	665 (7.75)	471 (7.11)	1354 (8.58)	3434 (11.71)	12160 (12.48)	18948 (11.52)
2. Power	149 (7.60)	452 (9.68)	1252 (14.60)	1212 (18.29)	2932 (18.58)	7016 (23.93)	24535 (25.16)	37548 (22.34)
3. Transport & Communication	518 (26.43)	1261 (26.99)	2112 (24.62)	1222 (18.45)	3080 (19.53)	6917 (23.59)	15546 (15.94)	30656 (18.64)
Total	1101 (56.17)	2143 (45.87)	4029 (46.97)	2905 (43.85)	7366 (46.69)	17367 (59.23)	52241 (53.58)	87152 (53.00)
B. Social								
4. Education	149 (7.61)	273 (5.84)	660 (7.69)	307 (4.64)	774 (4.90)	1285 (4.38)	2524 (2.59)	5972 (3.63)
5. Health	98 (5.00)	228 (4.88)	356 (4.16)	211 (3.18)	366 (2.32)	682 (2.33)	1821 (1.87)	3762 (2.29)
Total	247 (12.61)	501 (10.72)	1016 (11.85)	518 (7.82)	1140 (7.22)	1967 (6.71)	4345 (4.46)	9734 (5.92)
GRAND TOTAL (A + B)	1348 (68.78)	2644 (56.59)	5045 (58.82)	3423 (51.67)	8506 (53.91)	19334 (65.94)	56586 (58.04)	96886 (58.92)
Total Plan Outlay	1960	4672	8577	6625	15778	29322	97500	164434

Note : Figures in parentheses denote percentages to total plan outlay.

Source : Statistical Pocket Book, India - 1980, Central Statistical Organisation, Department of Statistics, Ministry of Planning, Government of India, New Delhi, June 1981.

A proportionately higher allocation of financial resources to development of economic infrastructure seems to be primarily the need base because access to an area by different kinds of economic infrastructure is indispensably required for gearing up the other economic activities. In view of these allocations, we observe that quite a large number of studies analysing the relationship between individual components of economic infrastructure and development have been carried out in India during the recent past.¹² But studies pertaining to the analysis of development taking into account an integrated view of economic infrastructure have rarely been attempted so far.

The present paper, therefore, aims at examining the inter-relationship between economic infrastructure and development and identifying the role of the former in the latter through comparative analysis of the relevant data available for different states at two points of time, i.e., 1970-71 and 1980-81. The major issues requiring special focus in the present context would be as follows :

First, it is argued that the availability of a similar kind of economic infrastructure does not produce a similar kind of economic benefits in different situations because of the differences in resource endowments/potentials, structure of economy and levels of development. Corollary to this, the requirement of a minimum quantum of economic infrastructure also differs from economy to economy obviously because of the differences in topography, climatic conditions, etc. It would, therefore, be interesting to analyse the role of economic infrastruc-

ture in augmenting the level of development in different regions or states.*

Second, strengthening of the basic economic infrastructure like power, road and irrigation has always been considered to be an essential prerequisite for accelerating the pace of development. With the result, a huge amount of investment has been made on the development of SOC particularly economic infrastructure in India during the previous plans. In spite of the consistent growth in the economic infrastructure, it is, however, alleged that a tendency of divergence in levels of economic infrastructure is, still, continuing. It would, therefore, be imperative to examine (i) as to what extent the provision of higher allocation of financial resources to backward states has resulted in an improvement in economic infrastructure, ii) whether inter-regional disparities in levels of economic infrastructure have shown a tendency of convergence during seventies as compared to sixties, (iii) is there any relationship between the levels of economic infrastructure and economic development, (iv) whether economic infrastructure enjoys the highest relative importance among the set of variables selected for analysing their functional relationship with economic development, and (v) to what extent the development of economic infrastructure has led to diversification of economy from primary to secondary and tertiary activities.

* Henceforth, the terms 'region' and 'state' have interchangeably been used in the analysis.

III. Methodology

To ensure comparability of results at the selected points of time, only 15 states of the country could be considered here simply because of the non-availability of data for rest of the states/ union territories. The data, compiled from secondary sources, mainly consist of various issues of Statistical Abstract and Census, Government of India, and the relevant publications of the Planning Department, Government of Uttar Pradesh, Lucknow particularly various issues of Inter-State Comparative Statistics.

The development, as conceived in the present context, is represented by a composite index based on the total vector of 18 indicators, each having values varying from state to state all over India. The main sectors, from where these indicators have been drawn, concern with agriculture, industry, services and urbanisation.¹³ On the other hand, the development level of economic infrastructure for different regions is represented by its composite index based on the total vector of 8 indicators.¹⁴ No doubt, the economic infrastructure is also one of the important constituents of development. But here the former is not treated as a part of the latter simply on the plea that contributions of various components of economic infrastructure are, already, subsumed in the selected indicators of development.

The index method has been used for working out the composite indices of both economic infrastructure and development for different states.¹⁵ Moreover regional disparities in levels of

both economic infrastructure and development have been measured, using the formula of weighted coefficient of variation (V_w). Theoretically, a higher value of V_w would indicate a higher magnitude of regional disparities and vice versa. Besides, the multiple regression model is used to examine the functional relationship between development and certain selected variables concerning key sectors of the economy with a view to assessing the relative importance of the latter in the former.

IV. State-wise Composite Indices of Economic Infrastructure and Development

1. The Year 1970-71

According to the composite index of economic infrastructure, the states of Punjab, Tamil Nadu, Kerala, Gujarat, Haryana, Karnataka, Himachal Pradesh and Andhra Pradesh attained a relatively higher level of economic infrastructure in 1970-71 and occupied their positions above the national average. Moreover, the seven states comprising West Bengal, Uttar Pradesh, Maharashtra, Rajasthan, Bihar, Orissa and Madhya Pradesh could achieve only lower level of economic infrastructure and held their positions below the national average, as would be evident from the following table :

Table 2

Ranking of States by Composite Indices of Economic
Infrastructure and Development - 1970-71

Sl. No.	State	Year - 1970-71			
		CIEI	Rank	CID	Rank
1.	Punjab	207.63	1	149.70	1
2.	Kerala	207.15	2	116.85	4
3.	Haryana	188.72	3	111.21	7
4.	Tamil Nadu	179.09	4	133.90	2
5.	Karnataka	142.44	5	103.67	8
6.	Gujarat	121.41	6	116.11	5
7.	Himachal Pradesh	108.57	7	91.75	12
8.	Andhra Pradesh	108.56	8	98.47	9
9.	West Bengal	97.26	9	115.97	6
10.	Uttar Pradesh	88.24	10	94.06	10
11.	Maharashtra	85.91	11	120.44	3
12.	Rajasthan	84.62	12	79.59	14
13.	Bihar	77.83	13	91.98	11
14.	Orissa	64.26	14	81.72	13
15.	Madhya Pradesh	62.63	15	74.29	15
INDIA		100.00	-	100.00	-
Weighted Coefficient of Variation (V_w)		38.64	-	17.56	-

Note : CIEI in the above table denotes composite index of economic infrastructure and CID stands for composite index of development. Both of them are based on the cross-section data of the selected indicators.

On the other hand, according to the composite index of development, the states of Punjab, Tamil Nadu, Maharashtra, Kerala, Gujarat, West Bengal, Haryana and Karnataka achieved a relatively higher level of development in 1970-71 and held their positions above the national average. Whereas, rest of the states consisting of Andhra Pradesh, Uttar Pradesh, Bihar, Himachal Pradesh, Orissa, Rajasthan and Madhya Pradesh could

achieve a relatively lower level of development and their composite indices knocked down the national average.

Looking to the inter-relationship between the two, we find that the six out of the eight states (i.e., Punjab, Tamil Nadu, Kerala, Gujarat, Haryana and Karnataka), which had relatively a higher level of economic infrastructure, also attained a relatively higher level of development. Moreover, the five states of Uttar Pradesh, Bihar, Orissa, Rajasthan and Madhya Pradesh, which had a relatively lower level of economic infrastructure, also attained only lower level of development.

However, the two pairs of states (Maharashtra-West Bengal and Andhra Pradesh-Himachal Pradesh) do not seem to carry a direct relationship between economic infrastructure and development. In case of the first pair of states (Maharashtra and West Bengal) we observe that in spite of economic infrastructure being relatively low, the level of development was found to be high (i.e., above the national average) during 1970-71. On the other hand, in respect of the second pair of states (i.e., Andhra Pradesh and Himachal Pradesh) we find that in spite of economic infrastructure being relatively high, the level of development was comparatively low, i.e., below the national average. These two opposing situations can be explained with the help of the level of urbanisation, contributions of secondary and tertiary sectors to net domestic product and utilisation levels of the existing economic infrastructure. The proportions of urban population to total population in Maharashtra and West

Bengal in 1970-71 were as high as 31.20 per cent and 24.70 per cent respectively, as would be evident from the following table :

Table 3

Urbanisation, Sectoral Contributions, Factory
Employment, Power Consumption and Credit-
Deposit Ratio in the four Selected
States of India During 1970-71

Sl. No.	State	Percent- age of urban popula- tion to total popula- tion	Percentage cont- ribution to State Domestic Product of Second- Tertiary ary Sector Sector		No.of workers employed in fact- ories per lakh of popu- lation	Per capi- ta consu- mption of power (kwh)	Cre- dit depo- sit ratio (%)
1.	Maharashtra	31.20	34.20	37.20	1990	158	88.90
2.	West Bengal	24.70	21.80	32.40	1896	118	109.80
3.	Andhra Pradesh	19.30	13.40	29.40	595	56	69.40
4.	Himachal Pradesh	8.00	16.90	26.00	318	35	26.60
	INDIA	19.90	19.70	30.32	901	90	70.70

Source : Inter-State Comparative Statistics - 1982,
Economics and Statistics Division, State Planning
Institute, Uttar Pradesh, Lucknow.

A relatively higher level of urbanisation has probably resulted in better diversified structure of economy in both the states of Maharashtra and West Bengal. The contributions of secondary sector to net domestic product in these two states worked out to be 34.20 per cent and 21.80 per cent respectively and the factory employment per lakh of population in the respective states was as high as 1990 and 1896 as against 901

at the national level. Not only this, even the contributions of tertiary sector to net domestic product in these two states were also found to be significantly high, i.e. 37.20 per cent and 32.40 per cent respectively. Besides, the utilisation levels of economic infrastructure in terms of per capita power consumption and credit-deposit ratio in Maharashtra was 158 kwh and 88.90 per cent respectively, whereas the corresponding figures in respect of West Bengal were found to be 118 kwh and 109.80 per cent as against the national averages of 90 kwh and 70.70 per cent. A cumulative effect of these factors probably led these two states to occupy a relatively higher level of development even in the wake of lower order of economic infrastructure.

Contrary to the above, we also observe that the low level of urbanisation in Andhra Pradesh (19.30%) and Himachal Pradesh (8.00%) during 1970-71 resulted in less diversified structure of economy. The contribution of secondary sector to net domestic product was comparatively low, i.e., 13.40 per cent in Andhra Pradesh and 16.90 per cent in Himachal Pradesh as against 19.70 per cent on all India level. Similarly, the factory employment per lakh of population in these two states was also quite low, i.e., 595 and 318 persons respectively. Moreover, the contributions of tertiary sector to net domestic product in these two states were respectively 29.40 per cent and 26.00 per cent only, as against the national average of 30.32 per cent. As to the utilisation levels of economic infrastructure, the per capita power consumption was 56 kwh in Andhra Pradesh and 35 kwh in

Himachal Pradesh as against 90 kwh at the national level. Besides, the credit-deposit ratios in these states accounted for 69.40 per cent and 26.60 per cent respectively. Cumulatively, these factors led to achieve only low level of development in these states, although both of them were found to be comparatively high in levels of economic infrastructure.

Thus, the foregoing analysis does not seem to convey any definite relationship between economic infrastructure and development. However, correlating these variables, a coefficient of 0.7541 emerges, indicating precisely a direct and positive relationship between the two.

2. The Year 1980-81

Probably because of the enforcement of the revised strategy 'tuned towards bottom-up' for balanced regional development during seventies, there have been some definite improvements in levels of both economic infrastructure and development of different states, as would be evident from the following table :

Table 4

Ranking of States by Composite Indices of Economic
Infrastructure and Development - 1980-81

Sl. No.	State	Year : 1980-81			
		CIEI	Rank	CID	Rank
1.	Punjab	216.50	1	164.92	1
2.	Haryana	157.83	2	120.86	3
3.	Kerala	141.33	3	107.59	7
4.	Tamil Nadu	135.08	4	121.90	2
5.	Gujarat	119.39	5	117.88	6
6.	Himachal Pradesh	115.14	6	93.17	10
7.	Karnataka	113.41	7	101.84	8
8.	Maharashtra	107.02	8	118.06	5
9.	West Bengal	103.02	9	119.13	4
10.	Andhra Pradesh	102.69	10	100.95	9
11.	Rajasthan	101.25	11	81.09	13
12.	Uttar Pradesh	93.53	12	92.07	11
13.	Bihar	77.56	13	89.60	12
14.	Orissa	72.86	14	77.14	14
15.	Madhya Pradesh	71.82	15	73.09	15
INDIA		100.00	-	100.00	-
Weighted Coefficient of Variation (V_w)		27.52	-	16.81	-

Note : CIEI in the above table denotes composite index of economic infrastructure and CID stands for composite index of development. Both of them are based on the cross section data of the selected indicators.

The three states of Maharashtra, West Bengal and Rajasthan, which had a relatively lower level of economic infrastructure in 1970-71, attained its higher pace during 1980-81, raising the total of such states from eight to eleven. However, the four states of Uttar Pradesh, Bihar, Orissa and Madhya Pradesh, which still hold their positions below the national average in respect of economic infrastructure, could not receive priority in

allocations of per capita plan outlay during 1951-79. Among these states, this varied from Rs.479 in Bihar to Rs.696 in Orissa as against the national average of Rs.734.¹⁶ Hence, they deserve a special consideration in providing proportionately higher allocations of financial resources in the subsequent plans.

On the other hand, following the criterion of ranking, we observe that the states of Punjab, Tamil Nadu, Maharashtra, Kerala, Gujarat, West Bengal, Haryana and Karnataka, which occupied a relatively higher level of development in 1970-71, also maintained a similar kind of position during 1980-81. But because of an improvement in socio-economic status of Andhra Pradesh, the total strength of the states having a relatively higher level of development increased from eight in 1970-71 to nine during 1980-81. According to the composite index of development, all these states are found to be above the national average during each of the selected points of time except Andhra Pradesh qualifying for higher level of development during the latter year only. Whereas the remaining states of Uttar Pradesh, Bihar, Himachal Pradesh, Orissa, Rajasthan and Madhya Pradesh continued to hold the position of a relatively lower order of development during these years, having the composite index of development below the national average.

Thus, some significant variations in the order of ranking of states separately for the two categories of relatively higher and lower levels of development are, no doubt, quite percep-

tible. But except in case of Andhra Pradesh, inter-state upward or downward movements in levels of development between the two categories has never occurred during the period 1971-81. This corroborates the hypothesis that development during the previous decade has followed the inter-regional pattern of 1970-71 only. Although almost all the states seem to be recipient of the benefits of previous planning, the state of Himachal Pradesh, Uttar Pradesh, Bihar, Rajasthan, Orissa and Madhya Pradesh, which according to the composite index of development still fall below the national average, require a special treatment for accelerating their pace of development in future.

Turning to the aspect of inter-relationship, we find that the state of Punjab, which had attained the highest levels of both economic infrastructure and development in 1970-71, also held the same position during 1980-81. Besides, during 1980-81 nine out of the eleven states having a relatively higher level of economic infrastructure (i.e., Punjab, Haryana, Kerala, Tamil Nadu, Gujarat, Karnataka, Maharashtra, West Bengal and Andhra Pradesh) also qualified for a relatively higher level of development. Moreover, the four states of Uttar Pradesh, Bihar Orissa and Madhya Pradesh, which had a relatively low level of economic infrastructure in both the selected years, could achieve only a relatively low level of development during these years. But the two states of Himachal Pradesh and Rajasthan, which had a relatively higher level of economic infrastructure in 1980-81,

could achieve only lower level of development obviously because of the low degree of urbanisation, less diversified structure of economy and low utilisation of the existing infrastructure/input facilities, as would be evident from the following table :

Table 5

Levels of Urbanisation, Sectoral Contributions and Utilisation of Existing Infrastructure/Input Facilities in Himachal Pradesh and Rajasthan - 1980-81

Sl. No.	State	Percent- age of urban popula- tion to total popula- tion	At 1970-71		Per lakh		Per capi- ta con- sumpt- ion of power (kwh)	Cons- ump- tion of fert- ilizer per ha. of cropp- ed area	% of net irr- iga- ted area to net sown
			Seco- ndary sec- tor	Ter- tia- ry sec- tor	No. of regd. fact- ories	Fac- tory emp- loy- ment			
1.	Himachal Pradesh	7.60	15.90	32.90	15	341	66	17.40	16.10
2.	Rajasthan	21.00	15.71	30.60	18	475	99	8.00	18.20
	INDIA	23.30	21.10	36.40	25	1051	135	31.90	25.80

Source : Inter-State Comparative Statistics - 1982,
Economics and Statistics Division, State
Planning Institute, Lucknow.

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It transpires from the above table that a relatively lower degree of urbanisation in Himachal Pradesh and Rajasthan has resulted in lower contributions of secondary and tertiary sectors to net domestic product, besides less concentration of registered

factories effecting lower order of factory employment. Moreover, low per capita consumption of power, less consumption of fertilizer per ha. of cropped area and low irrigation coverage are the other factors causing a slow and vacillating process of diversification in these States. Thus, the rapid development of economic infrastructure in these states has not resulted in a commensurate development of the economy.

The foregoing analysis provides us at least some indications to conclude that barring few states economic infrastructure seems to have moved hand-in-glove with development. Precisely, the coefficient of correlation between the two for different states, which comes out to be as much as 0.9225, also corroborates the high degree of association between economic infrastructure and development.

Besides, the coefficients of correlation between the economic infrastructure and certain key indicators of development also go in favour of the above finding, as would be evident from the following table :

Table 6
Coefficient of Correlation Between Economic Infra-
structure and Certain Key Indicators of
Development

Sl. No.	Coefficient of Correlation Between Economic Infrastructure and	Correlation Coefficients	
		1970-71	1980-81
1.	Per Capita consumption of power	.3810	.6864
2.	Consumption of fertilizer per ha. of cropped area	.7589	.8306
3.	Irrigation coverage	.5632	.6507
4.	Value of agricultural produce per ha. of net area sown	.3187	.5858
5.	Value added by manufacture per industrial worker	.6549	.7276
6.	Per capita state domestic product	.5556	.8265
7.	Urbanisation	.4364	.6460

As shown above, the value of coefficient of correlation between economic infrastructure and each of the selected variables of development has gone up during 1980-81 as compared to 1970-71. This means that economic infrastructure has become much closer to development within the period of a previous decade.

Regarding the regional disparities, we find that weighted coefficient of variation (V_w) in levels of economic infrastructure for 15 states, which was 38.61 per cent in 1970-71, significantly reduced to 27.52 per cent during 1980-81. Whereas the corresponding coefficient of variation in respect of development showed a marginal decrease from 17.56 per cent to 16.81 per cent during this period. A significant reduction in regional disparities of the former is obviously because of the massive investment on the development of economic infrastructure in backward states during the previous decade.

On the other hand, a marginal decline in regional disparities of development can be attributed to percentage increase/decrease in the efficiency use of investment of different states during the reference period, details of which are given below :

Table 7

State-wise Changes in the Index of Efficiency Use
of Investment During 1980-81 Over the Base
1970-71

Sl. No.	State	Index of efficiency use of investment during		Percentage in- crease (+)/ decrease (-) in 1980-81 over 1970-71
		1970-71	1980-81	
1.	Punjab	72.09	76.17	+ 5.65
2.	Kerala	56.40	76.12	+34.96
3.	Haryana	58.92	76.57	+30.84
4.	Tamil Nadu	74.76	90.24	+20.70
5.	Karnataka	72.78	89.79	+23.37
6.	Gujarat	95.63	98.73	+ 3.24
7.	Himachal Pradesh	84.50	80.91	- 4.25
8.	Andhra Pradesh	90.70	98.30	+ 8.37
9.	West Bengal	119.23	115.63	- 3.02
10.	Uttar Pradesh	106.59	98.43	- 7.66
11.	Maharashtra	140.19	110.31	-21.32
12.	Rajasthan	94.05	80.08	-14.86
13.	Bihar	118.18	115.52	- 2.26
14.	Orissa	127.17	105.89	-16.74
15.	Madhya Pradesh	118.61	101.76	-14.21

Note : Index of efficiency use of investment for different states is arrived at by using the formula $\frac{CID}{CIEI} \times 100$,

where CID indicates composite index of development and CIEI denotes composite index of economic infrastructure.

According to the above table, in almost all the states having a higher level of development, the efficiency use of investment in percentage terms accelerated to a considerable extent during 1980-81 over the base year 1970-71 with exceptions of Maharashtra and West Bengal. Moreover, wide variations in the percentage increase of efficiency use of investment are noticed among these states, ranging from 3.24

per cent in Gujarat to 34.96 per cent in Kerala. Contrary to this, the reverse trend is perceptible in case of the developing states. In almost all these states, the efficiency use of investment registered a negative growth during the period with the sole exception of Andhra Pradesh. In juxtaposition, we also notice a wide variation in percentage decrease of efficiency use of investment among developing states, ranging from - 2.26 per cent in Bihar to - 16.74 per cent in Orissa.

Another dimension associated with the phenomenon of a marginal reduction in regional disparities of development during seventies seems to be the time lag involved between making the economic infrastructure available and its effective utilisation particularly in case of developing states. In fact, effective utilisation of economic infrastructure is inter alia functionally related to the awareness, willingness and participation of the people which is generally found to be lacking in these states. Owing to insufficiency of the required time lag, it was really an insurmountable task for the developing states to achieve the desired levels of development, despite the presence of recently developed economic infrastructure. Consequently, a significant reduction in the regional disparities failed to materialise as witnessed by the marginal decrease in the coefficient of variation during seventies.

V. Functional Relationship Between Development and Certain Key Variables

In the preceding section, we have seen that there exists a high degree of association between economic infrastructure and development. Now we proceed to examine the functional relationship between development and certain key variables of the economy with a view to assessing the relative importance of each one of the latter in the former through multiple regression analysis. For this purpose, we have selected composite index of development (y) as a dependent variable and separate contributions of primary (x_1), secondary (x_2), tertiary (x_3) sectors to net domestic product and composite index of economic infrastructure (x_4) as independent variables.

For determining the coefficients of the selected independent variables, the state-wise composite index of development (y) has been treated as a function of the selected independent variables, i.e., x_1 , x_2 , x_3 and x_4 . The coefficients, thus, arrived at by estimating the multiple regression model separately for 1970-71 and 1980-81 are shown below :

1970-71

$$Y = 14.138 + 0.037 x_1 + 0.017 x_2 + 0.040 x_3 + 0.378 x_4$$

$$t = \quad \quad \quad (1.54) \quad \quad (0.91) \quad \quad (0.48) \quad \quad (5.65)$$

$$R^2 = 0.87$$

$$D.f. = 11$$

1980-81

$$y = 1.593 + 0.019 x_1 + 0.129 x_2 + 0.045 x_3 + 0.553 x_4$$

$$t = \quad (0.85) \quad (1.31) \quad (0.64) \quad (9.32)$$

$$R^2 = 0.97$$

$$D.f. = 11$$

Thus, the economic infrastructure in an aggregative form seems to have played the highest role in development at both the selected points of time as witnessed by its coefficient, the value of which increased from 0.378 in 1970-71 to 0.553 during 1980-81. However, in case of primary and secondary sectors, we observe that the relative importance of the former in development in terms of coefficient significantly reduced from 0.037 in 1970-71 to 0.019 during 1980-81, whereas the corresponding coefficient of the latter appreciably increased from 0.017 to 0.129 during this period. The deceleration in the relative importance of primary sector accompanied by the corresponding acceleration in respect of secondary and tertiary sectors clearly indicates that there have been some definite shifts in the structure of economy both at the national as well as state levels during the reference period. The share of primary sector in the net domestic product at the national level at constant prices of 1970-71 slumped from 50.10 per cent to 42.50 per cent during 1980-81 - a loss of 7.60 percentage points. The contribution of secondary sector increased, although not substantially, from 19.70 per cent in 1970-71 to 21.10 per cent during 1980-81, besides a considerable increase in the share of tertiary sector from 30.20 per cent to 36.40 per cent during this period. A similar kind of shift is also noticed in almost all the states of the country.¹⁷

Thus, the downward trend in the share of primary sector and the upward trend in those of the secondary and tertiary sectors seem to be prominent during the previous decade. One may, therefore, conclude that by and large the downward trend in the share of the primary sector was off-set by the upward trend in the shares of secondary and tertiary sectors in net domestic product. A decline in the proportionate share of the primary sector means that the rate of growth of its net output was lower than the rate of growth of total output for the country. Whereas a rise in the proportionate shares of the secondary and tertiary sectors means that the rates of growth of their net outputs were higher than that of the total output at the national level.

VI. Conclusions

The analysis of the composite index of economic infrastructure at two points of time suggests that the position of economic infrastructure has improved tremendously during the previous decade. However, inadequacy of economic infrastructural facilities in the states of Uttar Pradesh, Bihar, Orissa and Madhya Pradesh still seems to be one of the major obstacles in the path of progress of the economy. Thus, development of economic infrastructure in these states for enhancing their capabilities of resource utilisation obviously becomes essential, besides ensuring proportionately higher allocations of per capita plan outlay as well as central assistance.

On the other hand, the analysis of the composite index of development at the selected points of time reveals that because of an improvement in the socio-economic status of Andhra Pradesh, the number of states having higher level of development showed a marginal increase from eight to nine during the reference period. But by and large it seems that development during the period of previous decade has followed the inter-regional pattern of 1970-71 only. Although almost all the states seem to have benefited from the previous planning, the states of Himachal Pradesh, Uttar Pradesh, Bihar, Rajasthan, Orissa and Madhya Pradesh, which still stand below the national average in respect of development, require a special treatment during the subsequent plans.

According to our temporal analysis, inter-regional disparities in levels of both economic infrastructure and development have shown the tendency of convergence or depolarisation during seventies. But the reduction in respect of the former was much faster as compared to the latter. This is probably because the rapid development in economic infrastructure has not resulted in a commensurate development of the economy in backward states.

A marginal decline in regional disparities in levels of development is largely explained by the percentage increase/decrease in the indices of efficiency use of investment during this period. In almost all the states having higher levels of development, the efficiency use of investment in percentage terms has accelerated to a considerable extent, whereas in

almost all the states having a lower level of development, the efficiency use of investment registered a negative growth, despite the presence of recently developed economic infrastructure. In fact, there seems to be the time lag involved between making the economic infrastructure available and its effective utilisation. The latter requires at least some time to develop awareness, willingness and adoption among the people which is generally found to be lacking in the states of lower order of development. Hence, development of economic infrastructure seems to be the necessary but not the sufficient condition for development. Virtually, the serious problems associated with the effective utilisation of economic infrastructure also need to be tackled simultaneously.

The coefficient of correlation between economic infrastructure and development as worked out separately for the selected points of time suggests that there exists a high degree of association between the two. Moreover, the analysis of the functional relationship between development and the associated variables based on the multiple regression model also establishes the highest relative importance of economic infrastructure in development at both the selected points of time. Besides, through temporal analysis of the coefficients of the other associated variables, we also notice a deceleration in the

coefficient of primary sector alongwith the simultaneous acceleration in those of the secondary and tertiary sectors. Corollary to this, the downward trend in the share of primary sector and the upward trend in those of the secondary and tertiary sectors in net domestic product are found to be prominent during the previous decade. It looks that, by and large, the downward trend in the share of primary sector was offset by the upward trend in the shares of secondary and tertiary sectors.

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13. Indicators of development selected for the analysis consist of : (i) Per capita state domestic product at 1970-71 prices, (ii) Share of primary sector in state domestic product at 1970-71 prices, (iii) Share of secondary sector in state domestic product at 1970-71 prices, (iv) Share of tertiary sector in state domestic product at 1970-71 prices, (v) Gross value of agricultural produce per ha. of net area sown at 1970-71 prices, (vi) Intensity of cropping, (vii) Percentage of commercial crops to gross cropped area, (viii) Consumption of fertilizer per ha. of cropped area, (ix) Irrigation coverage, (x) Irrigation intensity, (xi) Per capita consumption of power, (xii) Value added by manufacture per industrial worker, (xiii) Number of registered factories per lakh of population, (xiv) Average daily factory employment per lakh

- coef: of population, (xv) Credit-deposit ratio, (xvi) Percentage
 accel of urban population to total population, ((xvii) Literacy
 Corol percentage, and (xviii) Number of allopathic hospitals/
 secto dispensaries per lakh of population.
- terti 14. The indicators of economic infrastructure comprise : (i)
 promi Rail length per 000 sq.km. of area, (ii) Road length per
 large lakh of population, (iii) Road length per 00 sq.km. of
 offse area, (iv) Percentage of villages electrified to total
 terti villages, (v) Percentage of irrigation potential created to
 net area sown, (vi) Bank offices per lakh of population,
 (vii) Number of goods vehicles (Reg.) per lakh of population,
 and (viii) Number of primary agricultural and non-agricul-
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